ECONOMIC ANALYSIS OF UTILITIES PRIVATIZATION ALTERNATIVES

ECONOMIC ANALYSIS REVIEW AND EXAMINATION

ANALYSES MAY BE EXAMINED BY:

- INSTALLATION COMMANDER
- MACOM
- HQDA [ASA(FM&C), ASA(I&E), ACSIM, DCSOPS, SEC ARMY, OTHERS]
- ACOE
- OSD
- DESC
- CONGRESS
- OTHERS (AUDIT AGENCIES)

REVIEW GUIDANCE

DA PAM 415-3, APPENDIX D
'GUIDELINES FOR REVIEWING ECONOMIC ANALYSES'

A LIST OF QUESTIONS THAT SHOULD BE USED TO ENSURE THAT AN ECONOMIC ANALYSIS IS COMPLETE, CORRECT AND PROPERLY DOCUMENTED, BEFORE SUBMISSION.

Prevalent Problems

Documentation

Agreement between text and numerical data

Bid alternative shown in analysis does not match bid

Sensitivity analyses missing

Cost elements not explained

Additional Questions

Does the analysis agree with the report text?

Are all cost factors fully explained?

Are all assumptions explained?

Are the data sources for each cost element documented?

If a cost element has major subdivisions, are they fully documented?

Wash and sunk costs should be discussed and excluded.

Differences in quality of service must be minimized.

Have sensitivity analyses been done and what were the results?

Do data used for bid match the actual bid?

Is the proper discount rate used?

If a cost has been inflated, has the proper factor been used?

Are all cost elements stated in same type of dollars (real or nominal)?

Do all cost elements have the correct inflation treatment?

SENSITIVITY ANALYSIS

EXAMINE EFFECTS OF UNCERTAINTIES ON OUTCOME OF ECONOMIC ANALYSIS

- **INTEREST RATE**
- **USAGE LEVELS: WHAT IS HISTORIC AND LIKELY FUTURE TREND; WAR OR EMERGENCY?**
- **PENALTIES, DISCOUNTS**
- **COST ELEMENTS WITH LEAST CERTAINTY**
- **LIKELY EVENTS**
- **MORE IMPORTANT IF DIFFERENCES AMONG OPTIONS ARE SMALL**

TYPES OF VALUATION

NOMINAL DOLLARS

CURRENT & INFLATED FUTURE

OFTEN USED IN BUDGETS

ACTUAL DOLLARS
PAID OR RECEIVED

ALSO CALLED
'CURRENT DOLLAR ANALYSIS'

REAL DOLLARS

INFLATION REMOVED

USED IN MAKING CHOICES

AMOUNT DOLLARS PAID OR
RECEIVED IN BASE YEAR PRICES

ALSO CALLED
'CONSTANT DOLLAR ANALYSIS'

DISCOUNT RATES BEGINNING JANUARY 1999

PERIOD OF ANALYSIS IN YEARS		DISCOUNT RATE TO USE			
AT LEAST	LESS THAN	NOMINAL $ ANALYSIS		REAL $ ANALYSIS	
	4	~~5.6%~~	4.7%	~~3.4%~~	2.6%
4	6	~~5.7%~~	4.8%	~~3.5%~~	2.7%
6	9	~~5.8%~~	4.9%	~~3.5%~~	2.7%
9	20	~~5.9%~~	4.9%	~~3.6%~~	2.7%
20		~~6.1%~~	5.0%	~~3.8%~~	2.9%

Source: OMB Circular A-94
Appendix C, Updated January 1999

Crossed out rates are the rates used for 1998

BUDGETING VS ECONOMIC ANALYSIS

1. SEPARATE PROCESSES

2. ECONOMIC ANALYSES ARE USED TO DETERMINE BEST ALTERNATIVE TO MEET GOVERNMENT REQUIREMENTS

3. ECONOMIC ANALYSIS DATA MAY NOT BE USEFUL FOR BUDGET PROCESS AND VICE VERSA

A. WASH AND SUNK COSTS OMITTED IN ANALYSIS

B. TIME BASIS MAY DIFFER FROM BUDGET PROCESS

C. ANALYSIS IGNORES SPREAD OVER DIFFERENT ORGANIZATIONS OR APPROPRIATIONS

OFFICIAL ECONOMIC ANALYSIS GUIDANCE DOCUMENTS

OFFICE OF MANAGEMENT AND BUDGET

OMB Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs
OMB Circular A-94 Appendix C (Updated January or February of every year)
http://www.whitehouse.gov/WH/EOP/OMB/html/circular.html

OFFICE OF SECRETARY OF DEFENSE

Department of Defense Instruction (DODI) 704 1.3
Economic Analysis for Decision Making (November 7, 1995)
http://web7.whs.osd.mil/corres.htm

HEADQUARTERS DEPARTMENT OF THE ARMY

DA Pamphlet 415-3 (Same as USACERL Technical Report P-89/08)
Construction: Economic Analysis: Description and Methods (10 August 1992)
http://www.usace.army.mil/inet/usace-docs/ (look under "Army Pamphlets")

ECONPACK SOFTWARE

SOFTWARE

ECONPACK for Windows Version 1.02
http://www.hq.usace.army.mil/cemp/e/ec/econ/epack/eptemp.htm
After downloading and installing the program, will need to contact:
US Army Engineering and Support Center, Huntsville
DSN 760- 1838 or (256)895- 1838

COURSE: INCLUDES INSTRUCTION IN SOFTWARE

US Army Corps of Engineers Professional Development Support Center
Huntsville, AL
Economic Analysis for Military Construction Course
http://www.hnd.usace.army.mil/to/pindex.htm
DSN 760-7421 or (256)895-7421

OTHER GUIDANCE

US Army Cost and Economic Analysis Center
(Part of Assistant Secretary of the Army (Financial Management and Comptroller)]
- Cost Analysis Manual
- Economic Analysis Manual
- Discount Rates

http://www.ceac.army.mil/

US Army Corps of Engineers Installation Support Center
http://www.usacpw.belvoir.army.mil/
(View publications page for documents including the REDBOOK)

Headquarters Army Corps of Engineers: Directorate of Military Programs, Engineering & Construction Division, Cost Engineering & Program Formulation Branch (CEMP-EE)
http://www.hq.usace.army.mil/cemp/e/ec/econ/econ.htm

USACERL Technical Report P-9 I /08
Cost Estimating Guide for Performing Economic Analyses in the Military Construction, Army (MCA) Process (January 199 I)

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residual value for each year of the analysis may be needed. The final residual or terminal value is always required.

C–2.

Table C–1 lists building decay–obsolescence, and site appreciation (land) factors that can be used to determine values at any point in time. These factors are for general use. The analyst may develop such factors for a particular analysis applicable to the local situation, but should document the rationale behind them in the report.

Table C–1
Building decay–obsolescence and site appreciation factors

Period of analysis	Building decay–obsolescence factors	Site appreciation factors
1	0.98300	1.01500
2	0.96629	1.03023
3	0.94986	1.04568
4	0.93371	1.06136
5	0.91784	1.07728
6	0.90224	1.09344
7	0.88690	1.10984
8	0.87182	1.12649
9	0.85700	1.14339
10	0.84243	1.16054
11	0.82811	1.17795
12	0.81403	1.19562
13	0.80019	1.21355
14	0.78659	1.23176
15	0.77322	1.25023
16	0.76007	1.26899
17	0.74715	1.28802
18	0.73445	1.30734
19	0.72197	1.32695
20	0.70969	1.34686
21	0.69763	1.36706
22	0.68577	1.38756
23	0.67411	1.40838
24	0.66265	1.42950
25	0.65139	1.45095
26	0.64031	1.47271
27	0.62943	1.49480
28	0.61873	1.51722
29	0.60821	1.53998
30	0.59787	1.56308

Notes:

The factors assume end–of–year building decay–obsolescence and site appreciation changes.

Appendix D
Guidelines for Reviewing Economic Analyses

D–1. General

The following checklist will be of use to both analysts and reviewers to ensure that an EA is complete, correct, and well documented. Once the analysis has been reviewed, decisionmakers should be able to accept the results, and use them in their decision process.

D–2. Objective, assumptions, and alternatives

a. Is the problem, as stated, the real problem?

b. Is the objective, as stated, unbiased as to the means of meeting the objective?

c. Are any reasonable alternatives left out of the analysis without an explanation?

d. Are assumptions—

(1) Too restrictive (e.g., do not allow an alternative to be considered)?

(2) Too broad (e.g., there will always be a requirement for a certain type facility)?

(3) Too vague to apply to the problem being studied?

e. Are uncertainties treated as facts? Can facts be verified?

f. Are potential mission change constraints on the economic life of an alternative given due consideration? Has the impact of technological change been fully considered?

g. Are any feasible alternatives omitted and, if so, are the reasons explained?

h. Are the alternatives well defined, and discrete (do not overlap)?

D–3. Cost estimates

a. Are the cost–estimating methods used obvious or, if not, explained? Are they appropriate?

b. Are all relevant costs included?

c. Are sunk costs properly excluded

d. Are the sources of the cost data given? Are these sources accurate, and applicable?

e. Have all cost estimates been made in the proper type dollars—base year constant dollars for the normal analysis, and current year dollars for an analysis with a lease alternative?Is the source of inflation indices given?

f. If parametric cost estimating was used, are the cost estimating relationships statistically/mathematically valid? Are the estimates interpolated within the range of historical data or has extrapolation been used?

g. Have terminal or residual values been included properly? Is the residual schedule appropriate?

D–4. Benefits

a. Should the analysis consider benefits other than the normal case where all alternatives give comparable benefits? Does the analysis ignore some part of total output?

b. Are the criteria used to measure a benefit defendable?

c. Is a benefit, in fact, unmeasurable? Is there a rational assessment of nonquantifiable factors?

d. If savings have been claimed, will a budget actually be reduced?

e. Have cost reductions been excluded from the benefit list to avoid double counting?

f. Have cost avoidance's been considered?

g. Have all advantages, and disadvantages of the alternatives been identified?

h. If an efficiency/productivity increase is projected, is there a documented need for greater output? If not, what is the impact on personnel requirements?

D–5. Time–dependent considerations

a. Was any lead time between the investment, and the start of economic life included?

b. Was the present value analysis performed correctly? Was the proper discount rate used?

c. Are the economic lives used reasonable, and sources given?

d. Is terminal value important in this analysis? If so, is it defendable?

e. If differential escalation has been assumed for a cost element, is there adequate justification?

f. If lead time differs among alternatives, have the economic lives been aligned?

D–6. Sensitivity analysis

a. If differential escalation was assumed, has a baseline analysis with no assumption of differential escalation been per formed?

b. If the analysis includes a lease alternative, was the proper discount rate used (based on treasury securities), and was a sensitivity performed on this rate?

c. Have sensitivity analyses been performed to examine effects of changes in dominant cost elements, economic life, etc.? If not, is the reason correct?

d. Have all relevant " what–if" questions been answered?

e. Have the results of sensitivity analyses been discussed, and incorporated in the report?

D–7. Recommendation of report

a. Is the selected alternative the logical result of the analysis ranking, and sensitivity analyses? If not, are the reasons for its selection justifiable?

b. Is the selected alternative feasible in the real world of political, cultural, and policy consideration?

c. Is the recommendation based on significant differences between the alternatives?

d. Does the selection make sense intuitively?

Appendix E
Computer Outputs From ECONPACK

Section I
MILCON Secondary Analysis called Fort Alice

E–1. Description of Output

a. There is a requirement to provide 95,000 square feet of unaccompanied officer housing for a period of 25 years. This is a new requirement.

b. There are two alternatives, modification to existing space or new construction. The economic lives of the alternatives are 25 years. (Two other alternatives were considered—BAQ/VHA and Lease—but neither was considered feasible.)

c. Beneficial occupancy will be in 1990. The start year and base year is 1988.

d. New construction data—

(1) Construction costs = $68.42/sf.

(2) Annual maintenance/repair costs = $.54/sf in FY 86 dollars.

(3) Utility costs = $.53/sf.

(4) Roof replacement in year 15 with cost = $9.00/sf.

(5) HVAC replacement in year 20 with cost = 18% of initial construction costs.

(6) Residual value = 40% of initial construction costs.

(e) *Modification data—*

(1) Renovation costs = $62.00/sf.

(2) Annual maintenance/repair costs = $1.30/sf.

(3) Utilities costs = $.87/sf.

(4) Roof replacement in year 15 = $9.00/sf.

(5) HVAC overhaul in year 20 = 18% of renovation costs.

(6) There is a demolition cost of $2.66/sf at the end of 25 years occupancy.

E–2. Discussion of output

a. The executive summary (fig E–2) is printed first. It includes a results, and recommendations section.

b. Figure E–3 is a graph of the NPVs of the alternatives.

c. The life cycle cost (LCC) report (fig E–4) is next and lists all costs for each year by alternative. The percent of the total NPV of an alternative for each cost is listed at the end of each cost column. This shows quickly which costs have the most impact on the NPV of the alternative. The source and derivation of costs and benefits are given at the end of the LCC report.

d. The final section (fig E–5) is the sensitivity analysis report.

Section II
Primary Analysis called Tobyhanna

E–3. Description of Output

a. There is a continuing requirement to maintain and store certain type shelters at the depot. Currently this is done in an open air environment, subject to weather conditions. This creates inefficiencies in the work, and also increases deterioration of the shelters while in storage.

b. The work could be done better inside a building and storage in a building would eliminate the deterioration due to storage in an unprotected environment.

c. A primary analysis was performed to evaluate the cost savings resulting from construction of an environmentally controlled warehouse. Current annual operating costs are $1,568,200.

d. New construction costs are estimated at $40.99/sf while operating and maintenance costs for a new facility would be$1.69/sf. The new facility would have a salvage value at the end of 25 years while there is none for the current operation.

E–4. Discussion of Output

a. The arrangement for the executive summary (fig E–6)is the same as for a secondary analysis. However, the values of two other measures are also printed (SIR and DPP).

b. The graph arrangement which is also similar to the secondary analysis is shown in figure E–7.

c. The life cycle cost (LCC) report provides the yearly cost data for each alternative; the arrangement is similar to that in a secondary analysis. However, there is an additional table of comparison in the LCC report unique to a primary analysis (see figure E–8).

d. At the end of the LCC report the source, and derivation of costs and benefits are given.

e. Figure E–9 gives results of the sensitivity analysis.

Section III
Analysis with Lease Option called Panama

E–5. Description of Output

a. Additional housing for 500 families for 15 years was required for an installation in the Panama Canal Zone.

b. Five alternatives were considered—

(1) Lease through the Republic of Panama

(2) Build to lease

(3) Rental Guarantee

(4) MCA construction

(5) Purchase trailers/relocatable units

c. Since this secondary analysis has a lease as an option, OMB Circular A–104 guidelines must be followed. The ten year treasury rate was 8.60%. Sensitivity of results to a change in the discount rate must be tested.

E–6. Discussion of output

a. This EA is a secondary analysis and the arrangement of the output is similar to that in section I.

b. First is the executive summary (see fig E–10).

c. The graph of the NPVs (fig E–11) of the alternatives is next.

d. The life cycle cost (LCC) report (fig E–12) is next and shows all costs for each year for each alternative. The source and derivation of costs and benefits are given at the end of the LCC report.

e. The sensitivity analysis report (fig E–13) for varying costs is given next.

f. Since this EA has a lease, a sensitivity analysis on the discount rate was also performed and is given in figure E–14 of the output. Figure E–15 gives a summary of how the rankings changed as the discount rate varied, and figure E–16 gives a detailed one which lists the NPV for each alternative for each value of the discount rate over the range evaluated.